



Dkt. 0575/61134-B/JPW/AJM/AJD

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Andrew R. Marks
U.S. Serial No.: 10/608,723
Filed: June 26, 2003
For: METHODS FOR TREATING AND PREVENTING CARDIAC
ARRHYTHMIA

1185 Avenue of the Americas
New York, New York 10036
January 28, 2004

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

INFORMATION DISCLOSURE STATEMENT

In accordance with his duty of disclosure under 37 C.F.R. §1.56, applicant would like to direct the Examiner's attention to the following references which are listed on the attached Form PTO-1449 (**Exhibit A**), and attached hereto as **Exhibits 1-72**, respectively:

1. Bennett, J. A., Clancy, Y. C. and McNeish, J. D. (1998) Identification and characterization of the murine FK506 binding protein (FKBP) 12.6 gene. Mamm. Genome 9: 1069-1071 (**Exhibit 1**);
2. Beuckelmann, D., Nabauer, M. and Erdmann, E. (1992) Intracellular calcium handling in isolated ventricular myocytes from patients with terminal heart failure. Circulation 85: 1046-1055 (**Exhibit 2**);
3. Bezprozvanny, I., Watras, J. and Ehrlich, B. (1991) Bell-shaped calcium response curves of $\text{Ins}(1,4,5)\text{P}_3$ - and calcium-gated channels from endoplasmic reticulum of cerebellum. Nature 351: 751-754 (**Exhibit 3**);

4. Bohm, M., Reiger, B., Schwinger, R. H. and Erdmann, E. (1994) cAMP concentrations, cAMP dependent protein kinase activity, and phospholamban in non-failing and failing myocardium. Cardiovasc. Res. 28: 1713-1719 (**Exhibit 4**);
5. Brillantes, A. B., Ondrias, K., Scott, A., Kobrinsky, E., Ondriasova, E., Moschella, M. C., Jayaraman, T., Landers, M., Ehrlich, B. E. and Marks, A. R. (1994) Stabilization of calcium release channel (ryanodine receptor) function by FK506-binding protein. Cell 77: 513-523 (**Exhibit 5**);
6. Bristow, M. R., Ginsburg, R., Minobe, W., Cubicciotti, R. S., Sageman, W. S., Lurie, K., Billingham, M. E., Harrison, D. C. and Stinson, E. B. (1982) Decreased catecholamine sensitivity and beta-adrenergic-receptor density in failing human hearts. New Engl. J. Med. 307: 205-211 (**Exhibit 6**);
7. Bristow, M. R., Minobe, W., Rasmussen, R., Larrabee, P., Skerl, L., Klein, J. W., Anderson, F. L., Murray, J., Mestroni, L., Karwande, S. V. et al. (1992) Beta-adrenergic neuroeffector abnormalities in the failing human heart are produced by local rather than systemic mechanisms. J. Clin. Invest. 89: 803-815 (**Exhibit 7**);
8. Cameron, A. M., Nucifora, F. C., Jr., Fung, E. T., Livingston, D. J., Aldape, R. A., Ross, C. A. and Snyder, S. H. (1997) FKBP12 binds the inositol 1,4,5-trisphosphate receptor at leucine-proline (1400-1401) and anchors calcineurin to this FK506-like domain. J. Biol. Chem. 272: 27582-27588 (**Exhibit 8**);
9. CIBIS-II (1999) The cardiac insufficiency bisoprolol study II (CIBIS-II): a randomised trial. Lancet 353: 9-13

(Exhibit 9);

10. Cohn, J. N., Levine, T. B., Olivari, M. T., Garberg, V., Lura, D., Francis, G. S., Simon, A. B. and Rector, T. (1984) Plasma norepinephrine as a guide to prognosis in patients with chronic congestive heart failure. N. Engl. J. Med. 311: 819-823 (Exhibit 10);
11. Dodge, K. L., Khouangsathiene, S., Kapiloff, M. S., Mouton, R., Hill, E. V., Houslay, M. D., Langeberg, L. K. and Scott, J. D. (2001) mAKAP assembles a protein kinase A/PDE4 phosphodiesterase cAMP signaling module. EMBO J. 20: 1921-1930 (Exhibit 11);
12. Fabiato, A. (1983) Calcium-induced release of calcium from the cardiac sarcoplasmic reticulum. Am. J. Physiol. 245: C1-C14 (Exhibit 12);
13. Fisher, J. D., Krikler, D. and Hallidie-Smith, K. A. (1999) Familial polymorphic ventricular arrhythmias: a quarter century of successful medical treatment based on serial exercise-pharmacologic testing. J. Am. Coll. Cardiol. 34: 2015-2022 (Exhibit 13);
14. Fozzard, H. A. (1992) Afterdepolarizations and triggered activity. Basic Res. Cardiol. 87: 105-113 (Exhibit 14);
15. Franzen, P., ten Dijke, P., Ichijo, H., Yamashita, H., Schulz, P., Heldin, C. H. and Miyazono, K. (1993) Cloning of a TGF beta type I receptor that forms a heteromeric complex with the TGF beta type II receptor. Cell 75: 681-692 (Exhibit 15);

16. Fraser, I. D. and Scott, J. D. (1999) Modulation of ion channels: a "current" view of AKAPs. Neuron 23: 423-426 (**Exhibit 16**);
17. Frazier, O. H. (1994) First use of an untethered, vented electric left ventricular assist device for long-term support. Circulation 89: 2908-2914 (**Exhibit 17**);
18. Gaburjakova, M., Gaburjakova, J., Reiken, S., Huang, F., Marx, S. O., Rosemlit, N. and Marks, A. R. (2001) FKBP12 binding modulates ryanodine receptor channel gating. J. Biol. Chem. 276: 16931-16935 (**Exhibit 18**);
19. Gillo, B., Ma, Y. S. and Marks, A. R. (1993) Calcium entry during induced differentiation in Murine erythroleukemia cells. Blood 81: 783-792 (**Exhibit 19**);
20. Go, L. O., Moschella, M. C., Watras, J., Handa, K. K., Fyfe, B. S. and Marks, A. R. (1995) Differential regulation of two types of intracellular calcium release channels during end-stage heart failure. J. Clin. Invest. 95: 888-894 (**Exhibit 20**);
21. Gomez, A. M., Valdivia, H. H., Cheng, H., Lederer, M. R., Santana, L. F., Cannell, M. B., McCune, S. A., Altschuld, R. A. and Lederer, W. J. (1997) Defective excitation-contraction coupling in experimental cardiac hypertrophy and heart failure. Science 276: 800-806 (**Exhibit 21**);
22. Hachida, M., Kihara, S., Nonoyama, M. et al. (1999) Protective effect of JT-519, a new 1,4-benzothiazepine derivative, on prolonged myocardial preservation. J. Card. Surg. 14: 187-193 (**Exhibit 22**);

23. Hain, J., Onoue, H., Mayrleitner, M., Fleischer, S. and Schindler, H. (1995) Phosphorylation modulates the function of the calcium release channel of sarcoplasmic reticulum from cardiac muscle. J. Biol. Chem. 270: 2074-2081 (**Exhibit 23**);
24. Harnick, D. J., Jayaraman, T., Ma, Y., Mulieri, P., Go, L. O. and Marks, A. R. (1995) The human type 1 inositol 1,4,5-trisphosphate receptor from T lymphocytes. Structure, localization, and tyrosine phosphorylation. J. Biol. Chem. 270: 2833-2840 (**Exhibit 24**);
25. Huse, M., Chen, Y. G., Massague, J. and Kuriyan, J. (1999) Crystal structure of the cytoplasmic domain of the type I TGF beta receptor in complex with FKBP12. Cell 96: 425-436 (**Exhibit 25**);
26. Jayaraman, T., Brillantes, A-M. B., Timerman, A. P., Erdjument-Bromage, H., Fleischer, S., Tempst, P. and Marks, A. R. (1992) FK506 binding protein associated with the calcium release channel (ryanodine receptor). J. Biol. Chem. 267: 9474-9477 (**Exhibit 26**);
27. Jayaraman, T., Ondrias, K., Ondriasova, E. and Marks, A. R. (1996) Regulation of the inositol 1,4,5-trisphosphate receptor by tyrosine phosphorylation. Science 272: 1492-1494 (**Exhibit 27**);
28. Jiang, D., Xiao, B., Zhang, L. and Chen, S. R. (2002) Enhanced basal activity of a cardiac Ca^{2+} release channel (ryanodine receptor) mutant associated with ventricular tachycardia and sudden death. Circ. Res. 91: 218-225 (**Exhibit 28**);

29. Kaftan, E., Marks, A. R. and Ehrlich, B. E. (1996) Effects of rapamycin on ryanodine receptor/ $\text{Ca}^{(2+)}$ -release channels from cardiac muscle. *Circ. Res.* 78: 990-997 (**Exhibit 29**);
30. Kaneko, N. (1994) New 1,4-benzothiazepine derivative, K201, demonstrates cardio-protective effects against sudden cardiac cell death and intracellular calcium blocking action. *Drug Dev. Res.* 33: 429-438 (**Exhibit 30**);
31. Kapiloff, M. S., Schillace, R. V., Westphal A. M. and Scott, J. D. (1999) mAKAP: an A-kinase anchoring protein targeted to the nuclear membrane of differentiated myocytes. *J. Cell Sci.* 112: 2725-2736 (**Exhibit 31**);
32. Kimura, J., Kawahara, M., Sakai, E. et al. (1999) Effects of a novel cardioprotective drug, JTV-519, membrane currents of guinea pig ventricular myocytes. *Jpn. J. Pharmacol.* 79: 275-281 (**Exhibit 32**);
33. Kirchhefer, U., Schmitz, W., Scholz, H. and Neumann, J. (1999) Activity of cAMP-dependent protein kinase and Ca^{2+} /calmodulin-dependent protein kinase in failing and nonfailing human hearts. *Cardiovasc. Res.* 42: 254-261 (**Exhibit 33**);
34. Laflamme, M. A. and Becker, P. L. (1999) Gs and adenylyl cyclase in transverse tubules of heart: implications for cAMP-dependent signaling. *Am. J. Phys.* 277: H1841-H1848 (**Exhibit 34**);
35. Laitinen, P. J., Brown, K. M., Piippo, K., Swan, H., Devaney, J. M. et al. (2001) Mutations of the cardiac ryanodine receptor (RyR2) gene in familial polymorphic

ventricular tachycardia. Circulation 103: 485-490 (**Exhibit 35**);

36. Leenhardt, A., Lucet, V., Denjoy, I., Grau, F., Ngoc, D. D. and Coumel, P. (1995) Catecholaminergic polymorphic ventricular tachycardia in children: a 7-year follow-up of 21 patients. Circulation 91: 1512-1519 (**Exhibit 36**);
37. Levin, H. R., Oz, M. C., Chen, J. M., Packer, M., Rose, E. A. and Burkhoff, D. (1995) Reversal of chronic ventricular dilation in patients with end-stage cardiomyopathy by prolonged mechanical unloading. Circulation 91: 2717-2720 (**Exhibit 37**);
38. Lorenz, M. C. and Heitman, J. (1995) TOR mutations confer rapamycin resistance by preventing interaction with FKBP12-rapamycin. J. Biol. Chem. 270: 27531-27537 (**Exhibit 38**);
39. MacDougall, L. K., Jones, L. R. and Cohen, P. (1991) Identification of the major protein phosphatases in mammalian cardiac muscle which dephosphorylate phospholamban. Eur. J. Biochem. 196: 725-734 (**Exhibit 39**);
40. Marban, E., Robinson, S. W. and Wier, W. G. (1986) Mechanisms of arrhythmogenic delayed and early afterdepolarizations in ferret ventricular muscle. J. Clin. Invest. 78: 1185-1192 (**Exhibit 40**);
41. Marks, A. R. (1996) Cellular functions of immunophilins. Physiol. Rev. 76: 631-649 (**Exhibit 41**);
42. Marks, A. R. (2000) Cardiac intracellular calcium release channels: role in heart failure. Circ. Res. 87: 8-11

(Exhibit 42);

43. Marx, S. O., Ondrias, K. and Marks, A. R. (1998) Coupled gating between individual skeletal muscle Ca^{2+} release channels (ryanodine receptors). Science 281: 818-821 (Exhibit 43);

44. Marx, S. O., Reiken S, Hisamatsu, Y., Gaburjakova, M., Gaburjakova, J., Yang, Y. M., Rosemlit, N. and Marks, A. R. (2001) Phosphorylation-dependent regulation of ryanodine receptors: a novel role for leucine/isoleucine zippers. J. Cell. Biol. 153: 699-708 (Exhibit 44);

45. Marx, S. O., Reiken, S., Hisamatsu, Y., Jayaraman, T., Burkhoff, D., Rosemlit, N. and Marks, A. R. (2000) PKA phosphorylation dissociates FKBP12.6 from the calcium release channel (ryanodine receptor): defective regulation in failing hearts. Cell 101: 365-376 (Exhibit 45);

46. McCartney, S., Little, B. M., Langeberg, L. K. and Scott, J. D. (1995) Cloning and characterization of A-kinase anchor protein 100 (AKAP100). A protein that targets A-kinase to the sarcoplasmic reticulum. J. Biol. Chem. 270: 9327-9333 (Exhibit 46);

47. Merit, H. F. (1999) Effect of metoprolol CR/XL in chronic heart failure: metoprolol CR/XL randomised intervention trial in congestive heart failure (MERIT-HF). Lancet 353: 2001-2007 (Exhibit 47);

48. Mitchell, G. F., Jeron, A. and Koren, G. (1998) Measurement of heart rate and Q-T interval in the conscious mouse. Am. J. Physiol. 274: H747-H751 (Exhibit 48);

49. Mohler, P. J., Schott, J. J., Gramolini, A. O., Dilly, K.W., Guatimosim, S. et al. (2003) Ankyrin-B mutation causes type 4 long-QT cardiac arrhythmia and sudden cardiac death. *Nature* 421: 634-639 (**Exhibit 49**);
50. Morgan, J., Erny, R., Allen, P., Grossman, W. and Gwathmey, J. (1990) Abnormal intracellular calcium handling: a major cause of systolic and diastolic dysfunction in ventricular myocardium from patients with end-stage heart failure. *Circulation* 81(suppl III): III21-III32 (**Exhibit 50**);
51. Moschella, M. C. and Marks, A. R. (1993) Inositol 1,4,5-trisphosphate receptor expression in cardiac myocytes. *J. Cell. Biol.* 120: 1137-1146 (**Exhibit 51**);
52. Nabauer, M., Callewart, G., Cleeman, L. and Morad, M. (1989) Regulation of calcium release is gated by calcium current, not gating charge, in cardiac myocytes. *Science* 244: 800-803 (**Exhibit 52**);
53. Neumann, J., Eschenhagen, T., Jones, L. R., Linck, B., Schmitz, W., Scholz, H. and Zimmermann, N. (1997) Increased expression of cardiac phosphatases in patients with end-stage heart failure. *J. Mol. Cell. Cardiol.* 29: 265-272 (**Exhibit 53**);
54. Otsu, K., Willard, H. F., Khanna, V. K., Zorato, F., Green, N. M. and MacLennan, D. H. (1990) Molecular cloning of cDNA encoding the Ca-2+ release channel (ryanodine receptor) of rabbit cardiac muscle sarcoplasmic reticulum. *J. Biol. Chem.* 265: 13472-13483 (**Exhibit 54**);
55. Pogwizd, S. M., McKenzie, J. P. and Cain, M. E. (1998)

Mechanisms underlying spontaneous and induced ventricular arrhythmias in patients with idiopathic dilated cardiomyopathy. Circulation 98: 2404-2414 (**Exhibit 55**);

56. Pogwizd, S. M., Schlotthauer, K., Li, L., Yuan, W. and Bers, D. M. (2001) Arrhythmogenesis and contractile dysfunction in heart failure: Roles of sodium-calcium exchange, inward rectifier potassium current, and residual beta-adrenergic responsiveness. Circ. Res. 88: 1159-1167 (**Exhibit 56**);
57. Priori, S. G., Napolitano, C., Memmi, M., Colombi, B., Drago, F. et al. (2002) Clinical and molecular characterization of patients with catecholaminergic polymorphic ventricular tachycardia. Circulation 106: 69-74 (**Exhibit 57**);
58. Priori, S. G., Napolitano, C., Tiso, N., Memmi, M., Vignati, G., Bloise, R., Sorrentino, V. V. and Danieli, G. A. (2001) Mutations in the cardiac ryanodine receptor gene (*hRyR2*) underlie catecholaminergic polymorphic ventricular tachycardia. Circulation 103: 196-200 (**Exhibit 58**);
59. Regitz-Zagrosek, V., Hertrampf, R., Steffen, C., Hildebrandt, A. and Fleck, E. (1994) Myocardial cyclic AMP and norepinephrine content in human heart failure. Eur. Heart J. 15 Suppl. D: 7-13 (**Exhibit 59**);
60. Reiken, S., Gaburjakova, M., Gaburjakova, J., He, K. L., Prieto, A. et al. (2001) Beta-adrenergic receptor blockers restore cardiac calcium release channel (ryanodine receptor) structure and function in heart failure. Circulation 104: 2843-2848 (**Exhibit 60**);

61. Reiken, S., Gaburjakova, M., Guatimosim, S., Gomez, A. M., D'Armiento, J. et al. (2003) Protein kinase A phosphorylation of the cardiac calcium release channel (ryanodine receptor) in normal and failing hearts. Role of phosphatases and response to isoproterenol. J. Biol. Chem. 278: 444-453 (**Exhibit 61**);
62. Song, Y. and Belardinelli, L. (1994) ATP promotes development of afterdepolarizations and triggered activity in cardiac myocytes. Am. J. Physiol. 267: H2005-2011 (**Exhibit 62**);
63. Swan, H., Piippo, K., Viitasalo, M., Heikkila, P., Paavonen, T. et al. (1999) Arrhythmic disorder mapped to chromosome 1q42-q43 causes malignant polymorphic ventricular tachycardia in structurally normal hearts. J. Am. Coll. Cardiol. 34: 2035-42 (**Exhibit 63**);
64. Takeshima, H., Nishimura, S., Matsumoto, T., Ishido, H., Kangawa, K., Minamino, N., Matsuo, H., Ueda, M., Hanaoka, H., Hirose, T. and Numa, S. (1989) Primary structure and expression from complementary DNA of skeletal muscle ryanodine receptor. Nature 339: 439-445 (**Exhibit 64**);
65. Valdivia, H. H., Kaplan, J. H., Ellis-Davies, G. C. and Lederer, W. J. (1995) Rapid adaptation of cardiac ryanodine receptors: modulation by Mg^{2+} and phosphorylation. Science 267: 1997-2000 (**Exhibit 65**);
66. Wang, J., Yi, G. H., Knecht, M., Cai, B. L., Poposkis, S., Packer, M. and Burkhoff, D. (1997) Physical training alters the pathogenesis of pacing-induced heart failure through endothelium-mediated mechanisms in awake dogs. Circulation

96: 2683-2692 (**Exhibit 66**);

67. Westphal, R. S., Tavalin, S. J., Lin, J. W., Alto, N. M., Fraser, I. D., Langeberg, L. K., Sheng, M. and Scott, J. D. (1999) Regulation of NMDA receptors by an associated phosphatase-kinase signaling complex. Science 285: 93-96 (**Exhibit 67**);
68. Wit, A. L. and Rosen, M. R. (1983) Pathophysiologic mechanisms of cardiac arrhythmias. Am. Heart J. 106: 798-811 (**Exhibit 68**);
69. Xin, H. B., Senbonmatsu, T., Cheng, D. S., Wang, Y. X., Copello, J.A. et al. (2002) Oestrogen protects FKBP12.6 null mice from cardiac hypertrophy. Nature 416: 334-338 (**Exhibit 69**);
70. Yamamoto-Hino, M., Sugiyama, T., Hikiti, K., Mattei, M.G., Hasegawa, K., Sekine, S., Sakurada, K., Miyawaki, A., Furuichi, T., Hasegawa, M. and Mikoshiba, K. (1994) Cloning and characterization of human type 2 and type 3 inositol 1,4,5-trisphosphate receptors. Recept. Channels 2: 9-22 (**Exhibit 70**);
71. Yang, J., Drazba, J. A., Ferguson, D. G. and Bond, M. (1998) A-kinase anchoring protein 100 (AKAP100) is localized in multiple subcellular compartments in the adult rat heart. J. Cell Biol. 142: 511-522 (**Exhibit 71**); and
72. Yano, M., Kobayashi, S., Kohno, M., Doi, M., Tokuhisa, T., Okuda, S., Suetsugu, M., Hisaoka, T., Obayashi, M., Ohkusa, T., Kohno, M. and Matsuzaki, M. (2003) FKBP12.6-mediated stabilization of calcium-release channel (ryanodine

Andrew R. Marks
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Filed: June 26, 2003
Page 13

receptor) as a novel therapeutic strategy against heart failure. Circulation 107: 477-484 (**Exhibit 72**).

If a telephone interview would be of assistance in advancing prosecution of the subject application, applicant's undersigned attorneys invite the Examiner to telephone them at the number provided below.

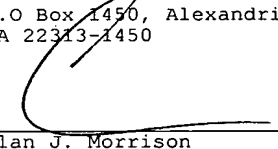
Pursuant to 37 C.F.R. §1.97(b)(3), no fee is deemed necessary in connection with the filing of this Information Disclosure Statement. However, if any fee is required, authorization is hereby given to charge the amount of such fee to Deposit Account No. 03-3125.

Respectfully submitted,

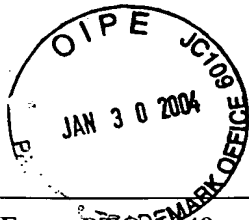


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I hereby certify that this correspondence is being deposited this date with the U.S. Postal Service with sufficient postage as first class mail in an envelope addressed to:
Commissioner for Patents
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VA 22313-1450


Alan J. Morrison
Reg. No. 37,399

1/28/04
Date



Form PTO-1449		U.S. Department of Commerce Patent and Trademark Office			Atty. Docket No. 0575/61134-B/JPW/AJM/AJD		Serial No. 10/608,723	
INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)					Applicants Andrew R. Marks		Art Unit	
					Filing Date June 26, 2003			
U.S. PATENT DOCUMENTS								
Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate	
FOREIGN PATENT DOCUMENTS								
		Document Number	Date	Country	Class	Subclass	Translation	
							Yes	No
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)								
	Bennett, J.A., Clancy, Y.C. and McNeish, J.D. (1998) Identification and characterization of the murine FK506 binding protein (FKBP) 12.6 gene. Mamm. Genome 9: 1069-1071;							
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	Cameron, A.M., Nucifora, F.C., Jr. Fung, E.T., Livingston, D.J., Aldape, R.A., Ross, C.A. and Snyder, S.H. (1997) FKBP12 binds the inositol 1,4,5-trisphosphate receptor at leucine-proline (1400-1401) and anchors calcineurin to this FK506-like domain. J. Biol. Chem. 272: 27582-27588;							
	CIBIS-II (1999) The cardiac insufficiency bisoprolol study II (CIBIS-II): a randomized trial. Lancet 353: 9-13 Cohn, J.N., Levine, T.B., Olivari, M.T., Garberg, V., Lura, D., Francis, G.S., Simon, A.B. and Rector, T. (1984) Plasma norepinephrine as a guide to prognosis in patients with chronic congestive heart failure. N. Engl. J. Med. 311: 819-823;							
	Cohn, J. N., Levine, T. B., Olivari, M. T., Garberg, V., Lura, D., Francis, G. S., Simon, A. B. and Rector, T. (1984) Plasma norepinephrine as a guide to prognosis in patients with chronic congestive heart failure. N. Engl. J. Med. 311: 819-823;							
EXAMINER				DATE CONSIDERED				
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609: Draw line through citation if not in conformance and not considered. Include copy of this from with next communication to applicant.								

Form PTO-1449		U.S. Department of Commerce Patent and Trademark Office		Atty. Docket No. 0575/61134-B/JPW/AJM/AJD	Serial No. 10/608,723
INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)				Applicants Andrew R. Marks	
				Filing Date June 26, 2003	Art Unit
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)					
	Dodge, K.L., Khouangsathiene, S., Kapiloff, M.S., Mouton, R., Hill, E.V., Houslay, M.D., Langeberg, L.K. and Scott, J.D. (2001) mAKAP assembles a protein kinase A/PDE4 phosphodiesterase cAMP signaling module. EMBO J. 20: 1921-1930;				
	Fabiato, A. (1983) Calcium-induced release of calcium from the cardiac sarcoplasmic reticulum. Am. J. Physiol. 245: C1-C14;				
	Fisher, J.D., Krikler, D. and Hallidie-Smith, K.A. (1999) Familial polymorphic ventricular arrhythmias: a quarter century of successful medical treatment based on serial exercise-pharmacologic testing. J. Am. Coll. Cardiol. 34: 2015-2022;				
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	Franzen, P., ten Dijke, P., Ichijo, H., Yamashita, H., Schulz, P., Heldin, C.H. and Miyazono, K. (1993) Cloning of a TGF beta type I receptor that forms a heteromeric complex with the TGF beta type II receptor. Cell 75: 681-692;				
	Fraser, I.D. and Scott, J.D. (1999) Modulation of ion channels: a "current" view of AKAPs. Neuron 23: 423-426;				
	Frazier, O.H. (1994) First use of an untethered, vented electric left ventricular assist device for long-term support. Circulation 89: 2908-2914;				
	Gaburjakova, M., Gaburjakova, J., Reiken, S., Huang, F., Marx, S.O., Rosemlit, N. and Marks, A.R. (2001) FKBP12 binding modulates ryanodine receptor channel gating. J. Biol. Chem. 276: 16931-16935;				
	Gillo, B., Ma, Y.S. and Marks, A.R. (1993) Calcium entry during induced differentiation in Murine erythroleukemia cells. Blood 81: 783-792;				
	Go, L.O., Moschella, M.C., Watras, J., Handa, K.K., Fyfe, B.S. and Marks, A.R. (1995) Differential regulation of two types of intracellular calcium release channels during end-stage heart failure. J. Clin. Invest. 95: 888-894;				
	Gomez, A.M., Valdivia, H.H., Cheng, H., Lederer, M.R., Santana, L.F., Cannell, M.B., McCune, S.A., Altschuld, R.A. and Lederer, W.J. (1997) Defective excitation-contraction coupling in experimental cardiac hypertrophy and heart failure. Science 276: 800-806;				
	Hachida, M., Kihara, S., Nonoyama, M. et al. (1999) Protective effect of JT-519, a new 1,4-benzothiazepine derivative, on prolonged myocardial preservation. J. Card. Surg. 14: 187-193;				
	Hain, J., Onoue, H., Mayrleitner, M., Fleischer, S. and Schindler, H. (1995) Phosphorylation modulates the function of the calcium release channel of sarcoplasmic reticulum from cardiac muscle. J. Biol. Chem. 270: 2074-2081;				
	Harnick, D.J., Jayaraman, T., Ma, Y., Mulieri, P., Go, L. O. and Marks, A.R. (1995) The human type I inositol 1,4,5-trisphosphate receptor from T lymphocytes. Structure, localization, and tyrosine phosphorylation. J. Biol. Chem. 270: 2833-2840;				
	Huse, M., Chen, Y.G., Massague, J. and Kuriyan, J. (1999) Crystal structure of the cytoplasmic domain of the type I TGF beta receptor in complex with FKBP12. Cell 96: 425-436;				
	Jayaraman, T., Brillantes, A.-M. B., Timerman, A.P., Erdjument-Bromage, H., Fleischer, S., Tempst, P. and Marks, A.R. (1992) FK506 binding protein associated with the calcium release channel (ryanodine receptor). J. Biol. Chem. 267: 9474-9477;				
EXAMINER			DATE CONSIDERED		
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609: Draw line through citation if not in conformance and not considered. Include copy of this from with next communication to applicant.					



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Atty. Docket No.

0575/61134-B/JPW/AJM/AJD

Serial No.

10/608,723

INFORMATION DISCLOSURE STATEMENT

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OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

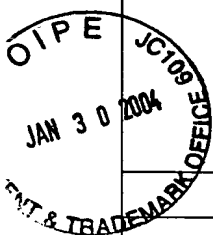
- Jayaraman, T., Ondrias, K., Ondriasova, E. and Marks, A.R. (1996) Regulation of the inositol 1,4,5-trisphosphate receptor by tyrosine phosphorylation. *Science* 272: 1492-1494;
- Jiang, D., Xiao, B., Zhang, L. and Chen, S.R. (2002) Enhanced basal activity of a cardiac Ca^{2+} release channel (ryanodine receptor) mutant associated with ventricular tachycardia and sudden death. *Circ. Res.* 91: 218-225;
- Kaftan, E., Marks, A.R. and Ehrlich, B.E. (1996) Effects of rapamycin on ryanodine receptor/ Ca^{2+} -release channels from cardiac muscle. *Circ. Res.* 78: 990-997;
- Kaneko, N. (1994) New 1,4-benzothiazepine derivative, K201, demonstrates cardio-protective effects against sudden cardiac cell death and intracellular calcium blocking action. *Drug Dev. Res.* 33: 429-438;
- Kapiloff, M.S., Schillace, R.V., Westphal A.M. and Scott, J.D. (1999) mAKAP: an A-kinase anchoring protein targeted to the nuclear membrane of differentiated myocytes. *J. Cell Sci.* 112: 2725-2736;
- Kimura, J., Kawahara, M., Sakai, E. et al. (1999) Effects of a novel cardioprotective drug, JTV-519, membrane currents of guinea pig ventricular myocytes. *Jpn. J. Pharmacol.* 79: 275-281;
- Kirchhefer, U., Schmitz, W., Scholz, H. and Neumann, J. (1999) Activity of cAMP-dependent protein kinase and Ca^{2+} /calmodulin-dependent protein kinase in failing and nonfailing human hearts. *Cardiovasc. Res.* 42: 254-261;
- Laflamme, M.A. and Becker, P.L. (1999) Gs and adenylyl cyclase in transverse tubules of heart: implications for cAMP-dependent signaling. *Am. J. Phys.* 277: H1841-H1848;
- Laitinen, P.J., Brown, K.M., Piippo, K., Swan, H., Devaney, J.M. et al. (2001) Mutations of the cardiac ryanodine receptor (RyR2) gene in familial polymorphic ventricular tachycardia. *Circulation* 103: 485-490;
- Leenhardt, A., Lucet, V., Denjoy, I., Grau, F., Ngoc, D.D. and Coumel, P. (1995) Catecholaminergic polymorphic ventricular tachycardia in children: a 7-year follow-up of 21 patients. *Circulation* 91: 1512-1519;
- Levin, H. R., Oz, M. C., Chen, J. M., Packer, M., Rose, E. A. and Burkhoff, D. (1995) Reversal of chronic ventricular dilation in patients with end-stage cardiomyopathy by prolonged mechanical unloading. *Circulation* 91: 2717-2720;
- Lorenz, M. C. and Heitman, J. (1995) TOR mutations confer rapamycin resistance by preventing interaction with FKBP12-rapamycin. *J. Biol. Chem.* 270: 27531-27537;
- MacDougall, L. K., Jones, L. R. and Cohen, P. (1991) Identification of the major protein phosphatases in mammalian cardiac muscle which dephosphorylate phospholamban. *Eur. J. Biochem.* 196: 725-734;
- Marban, E., Robinson, S. W. and Wier, W. G. (1986) Mechanisms of arrhythmogenic delayed and early afterdepolarizations in ferret ventricular muscle. *J. Clin. Invest.* 78: 1185-1192;
- Marks, A. R. (1996) Cellular functions of immunophilins. *Physiol. Rev.* 76: 631-649;
- Marks, A. R. (2000) Cardiac intracellular calcium release channels: role in heart failure. *Circ. Res.* 87: 8-11;
- Marx, S. O., Ondrias, K. and Marks, A. R. (1998) Coupled gating between individual skeletal muscle Ca^{2+} release channels (ryanodine receptors). *Science* 281: 818-821;

EXAMINER

DATE CONSIDERED

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609: Draw line through citation if not in conformance and not considered. Include copy of this from with next communication to applicant.





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INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)				Applicants Andrew R. Marks	
				Filing Date June 26, 2003	Art Unit
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)					
	Marx, S. O., Reiken S, Hisamatsu, Y., Gaburjakova, M., Gaburjakova, J., Yang, Y. M., Rosemblit, N. and Marks, A. R. (2001) Phosphorylation-dependent regulation of ryanodine receptors: a novel role for leucine/isoleucine zippers. J. Cell. Biol. 153: 699-708;				
	Marx, S. O., Reiken, S., Hisamatsu, Y., Jayaraman, T., Burkhoff, D., Rosemblit, N. and Marks, A. R. (2000) PKA phosphorylation dissociates FKBP12.6 from the calcium release channel (ryanodine receptor): defective regulation in failing hearts. Cell 101: 365-376;				
	McCartney, S., Little, B. M., Langeberg, L. K. and Scott, J. D. (1995) Cloning and characterization of A-kinase anchor protein 100 (AKAP100). A protein that targets A-kinase to the sarcoplasmic reticulum. J. Biol. Chem. 270: 9327-9333;				
	Merit, H. F. (1999) Effect of metoprolol CR/XL in chronic heart failure: metoprolol CR/XL randomised intervention trial in congestive heart failure (MERIT-HF). Lancet 353: 2001-2007;				
	Mitchell, G. F., Jeron, A. and Koren, G. (1998) Measurement of heart rate and Q-T interval in the conscious mouse. Am. J. Physiol. 274: H747-H751;				
	Mohler, P. J., Schott, J. J., Gramolini, A. O., Dilly, K.W., Guatimosim, S. et al. (2003) Ankyrin-B mutation causes type 4 long-QT cardiac arrhythmia and sudden cardiac death. Nature 421: 634-639;				
	Morgan, J., Erny, R., Allen, P., Grossman, W. and Gwathmey, J. (1990) Abnormal intracellular calcium handling: a major cause of systolic and diastolic dysfunction in ventricular myocardium from patients with end-stage heart failure. Circulation 81(suppl III): III21-III32;				
	Moschella, M. C. and Marks, A. R. (1993) Inositol 1,4,5-trisphosphate receptor expression in cardiac myocytes. J. Cell. Biol. 120: 1137-1146;				
	Nabauer, M., Callewart, G., Cleeman, L. and Morad, M. (1989) Regulation of calcium release is gated by calcium current, not gating charge, in cardiac myocytes. Science 244: 800-803;				
	Neumann, J., Eschenhagen, T., Jones, L. R., Linck, B., Schmitz, W., Scholz, H. and Zimmermann, N. (1997) Increased expression of cardiac phosphatases in patients with end-stage heart failure. J. Mol. Cell. Cardiol. 29: 265-272;				
	Otsu, K., Willard, H. F., Khanna, V. K., Zorato, F., Green, N. M. and MacLennan, D. H. (1990) Molecular cloning of cDNA encoding the Ca-2+ release channel (ryanodine receptor) of rabbit cardiac muscle sarcoplasmic reticulum. J. Biol. Chem. 265: 13472-13483;				
	Pogwizd, S. M., McKenzie, J. P. and Cain, M. E. (1998) Mechanisms underlying spontaneous and induced ventricular arrhythmias in patients with idiopathic dilated cardiomyopathy. Circulation 98: 2404-2414;				
	Pogwizd, S. M., Schlotthauer, K., Li, L., Yuan, W. and Bers, D. M. (2001) Arrhythmogenesis and contractile dysfunction in heart failure: Roles of sodium-calcium exchange, inward rectifier potassium current, and residual beta-adrenergic responsiveness. Circ. Res. 88: 1159-1167;				
	Priori, S. G., Napolitano, C., Memmi, M., Colombi, B., Drago, F. et al. (2002) Clinical and molecular characterization of patients with catecholaminergic polymorphic ventricular tachycardia. Circulation 106: 69-74;				
	Priori, S. G., Napolitano, C., Tiso, N., Memmi, M., Vignati, G., Bloise, R., Sorrentino, V. V. and Danieli, G. A. (2001) Mutations in the cardiac ryanodine receptor gene (<i>hRyR2</i>) underlie catecholaminergic polymorphic ventricular tachycardia. Circulation 103: 196-200;				
	Regitz-Zagrosek, V., Hertrampf, R., Steffen, C., Hildebrandt, A. and Fleck, E. (1994) Myocardial cyclic AMP and norepinephrine content in human heart failure. Eur. Heart J. 15 Suppl. D: 7-13;				
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OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

Reiken, S., Gaburjakova, M., Gaburjakova, J., He, K. I., Prieto, A. et al. (2001) Beta-adrenergic receptor blockers restore cardiac calcium release channel (ryanodine receptor) structure and function in heart failure. *Circulation* 104: 2843-2848;

Reiken, S., Gaburjakova, M., Guatimosim, S., Gomez, A. M., D'Armiento, J. et al. (2003) Protein kinase A phosphorylation of the cardiac calcium release channel (ryanodine receptor) in normal and failing hearts. Role of phosphatases and response to isoproterenol. *J. Biol. Chem.* 278: 444-453;

Song, Y. and Belardinelli, L. (1994) ATP promotes development of afterdepolarizations and triggered activity in cardiac myocytes. *Am. J. Physiol.* 267: H2005-2011;

Swan, H., Piippo, K., Viitasalo, M., Heikkila, P., Paavonen, T. et al. (1999) Arrhythmic disorder mapped to chromosome 1q42-q43 causes malignant polymorphic ventricular tachycardia in structurally normal hearts. *J. Am. Coll. Cardiol.* 34: 2035-42;

Takeshima, H., Nishimura, S., Matsumoto, T., Ishido, H., Kangawa, K., Minamino, N., Matsuo, H., Ueda, M., Hanaoka, H., Hirose, T. and Numa, S. (1989) Primary structure and expression from complementary DNA of skeletal muscle ryanodine receptor. *Nature* 339: 439-445;

Valdivia, H. H., Kaplan, J. H., Ellis-Davies, G. C. and Lederer, W. J. (1995) Rapid adaptation of cardiac ryanodine receptors: modulation by Mg^{2+} and phosphorylation. *Science* 267: 1997-2000;

Wang, J., Yi, G. H., Knecht, M., Cai, B. L., Poposkis, S., Packer, M. and Burkoff, D. (1997) Physical training alters the pathogenesis of pacing-induced heart failure through endothelium-mediated mechanisms in awake dogs. *Circulation* 96: 2683-2692;

Westphal, R. S., Tavalin, S. J., Lin, J. W., Alto, N. M., Fraser, I. D., Langeberg, L. K., Sheng, M. and Scott, J. D. (1999) Regulation of NMDA receptors by an associated phosphatase-kinase signaling complex. *Science* 285: 93-96;

Wit, A. L. and Rosen, M. R. (1983) Pathophysiologic mechanisms of cardiac arrhythmias. *Am. Heart J.* 106: 798-811;

Xin, H. B., Senbonmatsu, T., Cheng, D. S., Wang, Y. X., Copello, J. A. et al. (2002) Oestrogen protects FKBP12.6 null mice from cardiac hypertrophy. *Nature* 416: 334-338;

Yamamoto-Hino, M., Sugiyama, T., Hikita, K., Mattei, M. G., Hasegawa, K., Sekine, S., Sakurada, K., Miyawaki, A., Furuichi, T., Hasegawa, M. and Mikoshiba, K. (1994) Cloning and characterization of human type 2 and type 3 inositol 1,4,5-trisphosphate receptors. *Recept. Channels* 2: 9-22;

Yang, J., Drazba, J. A., Ferguson, D. G. and Bond, M. (1998) A-kinase anchoring protein 100 (AKAP100) is localized in multiple subcellular compartments in the adult rat heart. *J. Cell Biol.* 142: 511-522; and

Yano, M., Kobayashi, S., Kohno, M., Doi, M., Tokuhisa, T., Okuda, S., Suetsugu, M., Hisaoka, T., Obayashi, M., Ohkusa, T., Kohno, M. and Matsuzaki, M. (2003) FKBP12.6-mediated stabilization of calcium-release channel (ryanodine receptor) as a novel therapeutic strategy against heart failure. *Circulation* 107: 477-484.

EXAMINER

DATE CONSIDERED

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